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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,364	07/26/2001	Hiroyuki Sakuyama	211429US2	6940

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EXAMINER	
HUNG, YUBIN	
ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/912,364	SAKUYAMA, HIROYUKI	
	Examiner	Art Unit	
	Yubin Hung	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9, 13-25, 29-45 and 49-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3-9,13-15,19-25,29-31,35,36,39-45 and 49-51* is/are allowed.

6)☒ Claim(s) *1,2,16-18,32-34,37,38,52 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment/Arguments

1. This action is in response to amendment filed 01/18/2005

2. Claims 10-12, 26-28 and 46-48 have been cancelled. Claims 1-9, 13-25, 29-45 and 49-53 are still pending.

3. In view of applicant's amendment, the objection to the specification has been withdrawn.

4. In view of the applicant's amendment, the 35 USC § 112 rejections have been withdrawn.

5. Applicant's arguments, see the 5th paragraph on page 18 (with respect to claims 1, 18, 34 and 37) of the response filed 01/18/2005, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Spaulding et al. (US 5,377,025).

6. Applicant's arguments, see the 2nd and the 3rd paragraphs (with respect to claims 13, 29, 36 and 49) on page 19 of the response filed 01/18/2005, have been fully

considered and are persuasive. The 35 USC § 103 rejections of claims 13, 29, 36 and 49 have been withdrawn.

7. Applicant's arguments regarding claims 16, 32, 52 (see pages 19-20) in the response filed 01/18/2005 have been fully considered but they are not persuasive; see below.

8. In remarks Applicant argued in substance:

7.1 that amended claim 32 recites that the permissible quantization error of a first color signal is influenced by other color and that this feature is not taught or disclosed by Yamagami. (P. 20, lines 1-3.)

However, such a feature has not been claimed. The rejections of claim 32 and claims 16 and 52, which recite substantially similar features, and their respective dependent claims 17, 33 and 53 are respectfully maintained.

Claim Rejections - 35 USC § 112

9. Amended claims 1-4, 18-20, 34 and 37-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, Claim 1, representative of claims 18, 34 and 37 are amended to include the limitation "distance in a uniform color space" in line 4. Although Applicant indicates (at the foot note on page 16 of the response filed 01/18/05) that support can be found at Figs. 15, 16 and page 29, line 11-page 32, line 19, the only place where a reference to a uniform color space is on page 31 (here, the Lab color space). However, the reference (lines 1-3 of page 31) does not mention anything about quantizing in such a way that the distance in a uniform color space per unit error caused by the quantization is within a predetermined value, let along how it is done.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 18, 34, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwakami et al (US 5,684,920), in view of Davidson et al. (US 6,246,345) and Spaulding et al. (US 5,377,025)..

Regarding claim 18, and similarly claims 1, 34 and 37, Iwakami discloses:

- quantizing said color signal thereof such that a *color difference* per unit error caused by quantization of said color signal is within a predetermined value
[Fig. 22, numerals S1-S3; Col. 22, lines 1-16. Note that for a color component V, a quantization error (i.e., color difference) of Q being less than a predetermined value of T is equivalent to Q/delta-V (i.e., color difference per unit) being less than T/delta-V. Note further that the method, while intended for quantizing audio signals, is applicable to image signals since both are digital signals]

Iwakami does not expressly disclose that quantization is performed over a plurality of regions nor that the color difference is measured as a distance in a uniform color space.

However, Davidson teaches/suggests quantization over multiple regions. [Fig. 9C. Note that there are multiple regions between –1.000 and 1.000.] In addition, Spaulding teaches using a distance in a uniform color space as the measure of the color difference. [See Col. 6, lines 3-10.]

Iwakami, Davidson and Spaulding are combinable because they both have aspects that are from the same fields of endeavor of quantization of digital signals.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Iwakami with the teachings of Davidson and Spaulding by performing quantization over a plurality of regions. The motivation would have been to minimize quantization error so that the resulting distortion is within an acceptable range and uniform with respect to human visual perception, as Spaulding indicates in [Col. 1, line 58-Col. 2, line 2].

Therefore, it would have been obvious to combine Davidson and Spaulding with Iwakami to obtain the invention as specified in claim 18.

12. Regarding claim 2 and similarly claim 38, they are rejected per the analysis of claims 1, 13, 34 and 37 above because the combined invention of Iwakami and Davidson quantizes all component color image signals, which certainly include the low frequency components.

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13. Claims 16, 17, 32, 33, 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagami et al. (US 5,072,290).

14. Regarding claim 32, and similarly claims 16 and 52, Yamagami further discloses

- quantizing said first color signal and a distance of a position from a locus of points of equal values of said first and second component color image signals, said position corresponding to said first and second color signals on a plane specified by said first and second color signals
  [Fig. 1, numerals 14Y, 14R. Note that Y is considered the first component and R the second component. Note further that for any Y value, say Y=a= $(\sqrt{2})\cdot 10$, the distance of position (a, 0), which is on the YB-plane, to the locus defined by Y=R is 10, a value within the range of Y as indicated in, Fig. 3 and would have been quantized by quantizer 14Y]

15. Regarding claim 33, and similarly claims 17 and 53, in addition to disclosing all limitations of its parent, claim 32, Yamagami further discloses

- quantizing at least one of a difference between said first and second color signals, and either one of said first and second color signals
  [Fig. 1, numerals 14Y and 14R. Note that 14R quantizes the difference, RY (=Y – R), between the color components Y and R]

Allowable Subject Matter

16. Claims 3-9, 13-15, 19-25, 29-31, 35, 36, 39-45, 49-51 are allowed.

17. The following is an examiner's statement of reasons for allowance:

18. Regarding claim 19, and similarly claims 3, and 39, the prior art of record fails to teach or suggest, alone or in combination, a method for processing a component color image signal comprising, along with other limitations:

- computing said color difference per unit error by averaging color differences over all values of G as a parameter among components R, G and B

19. Regarding claim 20, and similarly claims 4 and 40, the prior art of record fails to teach or suggest, alone or in combination, a method for processing a component color image signal comprising, along with other limitations:

- obtaining said color difference per unit error as an envelope drawn through maximal points of color difference versus component color image signal plots for all values of G as a parameter among components R, G and B

20. Regarding claim 21, and similarly claims 5, 35 and 41, the prior art of record fails to teach or suggest, alone or in combination, a method for processing a component color image signals comprising, along with other limitations:

- quantizing said component color image signal under a quantization level number different for each of a plurality of quantization regions specified by a value of said component color image signal corresponding to a maximum of a color difference per unit error caused by quantization of said component color image signal

Closest art of record Yamagami et al. (US 5,072,290) discloses using allowable quantization error (such as measured by L*a*b color difference, for example) to guide subsequent quantization. [See Col. 1, lines 54-64.] However, Yamagami does not teach using the maximum of the quantization error to partition the color component signal values into regions so that each region can be assigned a different quantization level number.

21. Regarding claim 30, and similarly claims 14 and 50, the prior art of record fails to teach or suggest, alone or in combination, a method for processing a plurality of component color image signals comprising, along with other limitations:

- quantizing one of said plurality of component color image signals depending on a position thereof on a plane identified by a subsection of said plane; said plane being specified by said plurality of component color image signals, as parameters, and divided into a plurality of said subsections with respect to a locus of maximal points of a color difference per unit error caused by a quantization error of said component color image signal to be presently quantized

22. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion and Contact Information

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
June 9, 2005

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